Contents

Preface xi

Sputter-Deposition Processes

Large-area selective thin film deposition by bias sputtering 1
S. Berg, I. V. Katardjiev, C. Nender and P. Carlsson (Uppsala, Sweden)

Epitaxial growth, structure and properties of Ni films grown on MgO(100) by d.c. bias sputter deposition 9
H. Qui, A. Kosuge (Tokyo, Japan), H. Maruyama (Saitama, Japan), M. Adamik, G. Safran, P. B. Barna (Budapest, Hungary) and M. Hashimoto (Tokyo, Japan)

Highly pressurized Kr agglomerates in sputtered Si films 12
M. J. W. Greuter, L. Niesen (Groningen, Netherlands), A. van Veen (Delft, Netherlands), M. Verwerft and J. Th. M. de Hosson (Groningen, Netherlands)

Composition of thin films deposited by ion beam sputtering of a compound target: case of Y–Ba–Cu–O 16
S. Benayoun, E. Salmon and R. J. Gaboriaud (Poitiers, France)

Alumina coating on polyethylene teraphthalate 21
F. Bodino, G. Baud (Aubière, France), M. Benmalek (Voreppe, France), J. P. Besse (Aubière, France), H. M. Dunlop (Voreppe, France) and M. Jacquet (Aubière, France)

Silicate glass films deposited by reactive r.f. magnetron sputtering: electrical characterization 25
G. Della Mea, V. Rigato, P. Colombo, R. Dal Maschio, C. Sighel, S. Zandolin (Padova, Italy) and P. K. Mwose (Nairobi, Kenya)

TiN_x magnetron sputter coating controlled by an *in situ* eddy current sensor 30
H. Klümper-Westkamp and P. Mayr (Bremen, Germany)

Silver thin films deposited by magnetron sputtering 34
N. Maréchal, E. Quesnel (Grenoble, France) and Y. Pauleau (St Martin d'Hères, France)

TiN layer synthesis by laser-plasma 39
A. L. Thomann, J. Hermann and C. Boulmer-Leborgne (Orleans, France)

Spectroscopic ellipsometry studies of indium tin oxide and other flat panel display multilayer materials 44
J. A. Woollam, W. A. McGahan and B. Johs (Lincoln, NE, USA)

Laser-Induced Chemical Vapour Deposition Processes

Electrical characterization of laser-induced deposits of aluminum on gallium arsenide 47
D. Tonneau, M. Cuniot, J. M. Laroche, H. Orain, J. F. Rommeluere and J. E. Bouree (Meudon, France)

Laser assisted metallization of polyphenylquinoxaline 52
G. Shafeev, W. Marine, H. Dallaporta, L. Bellard and A. Cros (Marseille, France)

Investigation of the microstructure, chemical composition and lateral growth kinetics of TiN films deposited by laser-induced chemical vapour deposition 57
A. J. Silvestre, M. L. G. F. Paramês and O. Conde (Lisbon, Portugal)

SF_6 sensitized CO_2-laser chemical vapour deposition of a-Ge:H 61
M. Barth, P. Hess (Heidelberg, Germany), G. Mollekopf and H. Stafast (Frankfurt, Germany)

Dependence of deposition kinetics on precursor concentration and writing speed in pyrolytic laser deposition from solution 67
Zs. Geretovszky, T. Szörényi, K. Bali (Dóm tér, Hungary) and A. Tóth (Budapest, Hungary)

Laser based chemical vapour deposition of titanium nitride coatings 71
U. Illmann, R. Ebert, G. Reisse (Mittweida, Germany), H. Freller and P. Lorenz (Erlangen, Germany)

Laser-assisted nickel deposition onto synthetic diamonds 76
V. A. Laptev (Vladimir, Russian Federation), S. M. Pimenov and G. A. Shafeev (Moscow, Russian Federation)

Elsevier Sequoia

Tailoring silicon oxide film properties by tuning the laser beam-to-substrate distance in ArF laser-induced chemical vapour deposition 80
T. Szörényi (Dóm tér, Hungary), P. González, E. García, J. Pou, D. Fernández, J. Serra, B. León and M. Pérez-Amor (Vigo, Spain)

Laser Ablation Processes

In-plane lattice constant relaxation during laser ablation of YBCO and yttria-stablized zirconia 84
H. Karl, J. Hartmann and B. Strizker (Augsburg, Germany)

Raman analysis of the modifications induced by laser processing and hydrogen implantation in carbon films deposited by the ablation technique 88
F. Antoni, B. Prévot, E. Fogarassy and S. de Unamuno (Strasbourg, France)

Deposition by plasma-assisted laser ablation and maskless patterning of $YBa_2Cu_3O_{7-x}$ superconducting thin films 92
P. Tejedor, M. Cagigal, J. L. Vicent and F. Briones (Madrid, Spain)

Real time emission spectroscopy during laser ablation of BiSrCaCuO targets 96
J. Gonzalo, F. Vega and C. N. Afonso (Madrid, Spain)

Deposition of $YBa_2Cu_3O_{7-x}$ thin films by channel-spark pulsed electron beam ablation 100
Q. D. Jiang, F. C. Matacotta, (Trieste, Italy), M. C. Konijnenberg, G. Müller and C. Schultheiss (Karlsruhe, Germany)

Ablation dynamics of silicon based targets in oxygen and nitrogen atmospheres 103
W. Marine, V. Tokarev, M. Gerri, M. Sentis (Marseille, France) and E. Fogarassy (Strasbourg, France)

Peculiarities of laser melting and evaporation of superconducting ceramics 109
V. Mazhukin (Moscow, Russian Federation), I. Smurov (Saint-Etienne, France), G. Flamant and C. Dupuy (Font-Romeu, France)

Structural characterization and properties of superconducting thin films produced by pulsed laser deposition 114
A. Giardini-Guidoni (Tito Scalo, Italy), D. Ferro (Rome, Italy), U. Gambardella, V. Marotta, R. Martino, A. Morone and S. Orlando (Tito Scalo, Italy)

Properties of laser pulse deposition oxide films 119
G. Reiße, B. Keiper, S. Weißmantel (Mittweida, Germany), H. Johansen, R. Scholz and T. Martini (Saale, Germany)

Laser induced ablation and epitaxial growth of SnSe 126
R. Teghil (Potenza, Italy), A. Giardini-Guidoni, A. Mele, S. Piccirillo, G. Pizzella (Rome, Italy) and V. Marotta (Potenza, Italy)

Time-resolved measurements of plume shielding during ArF laser ablation of silicon 129
V. Tokarev, W. Marine (Marseille, France), J. G. Lunney (Dublin, Ireland) and M. Sentis (Marseille, France)

A new method for reduction of droplet deposition onto laser deposited thin metal films 134
E. van de Riet, U. K. P. Biermann (Eindhoven, Netherlands) and J. Dieleman (Waalre, Netherlands)

SiC thin films prepared by pulsed excimer laser deposition 138
T. Zehnder, A. Blaater and A. Bächli (Bern, Switzerland)

Laser Beam-Induced Surface Modifications of Materials

Pulsed laser induced modifications of metal silicide layers 142
P. Baeri (Catania, Italy)

Segregation of impurities and defects in $Hg_{0.8}Cd_{0.2}Te$ by laser annealing 151
R. Ciach, M. Faryna (Cracow, Poland), M. Kuźma, M. Pociask and E. Sheregii (Rzeszów, Poland)

Preparation of $Si_{1-x}Ge_x$ thin crystalline films by pulsed excimer laser annealing of heavily Ge implanted Si 155
F. Repplinger, E. Fogarassy, A. Grob, J. J. Grob, D. Muller, B. Prévot, J. P. Stoquert and S. de Unamuno (Strasbourg, France)

Low Energy Ion-Assisted Deposition Processes

Advanced scientific semiconductor processing based on high-precision controlled low-energy ion bombardment 159
T. Ohmi and T. Shibata (Sendai, Japan)

Modelling of layer-by-layer sputtering of Si(111) surfaces under irradiation with low-energy ions 167
V. A. Zinovyev, L. N. Aleksandrov, A. V. Dvurechenskii (Novosibirsk, Russian Federation), K.-H. Heinig (Dresden, Germany) and D. Stock (Jena, Germany)

Microstructural evolution of non-hydrogenated amorphous carbon under ion beam assistance 171
B. André (Grenoble, France), F. Rossi (Petter, Netherlands), A. van Veen, P. E. Mijnarends, H. Schut (Delft, Netherlands) and M. P. Delplancke (Bruxelles, Belgium)

XAS and XRD structural studies of titanium oxide thin films prepared by ion beam induced CVD 175
D. Leinen, A. Fernández, J. P. Espinós, A. Caballero, A. Justo and A. R. González-Elipe (Sevilla, Spain)

Ion Beam-Assisted Deposition and Ion Beam Mixing

Ion plating: optimum surface performance and material conservation 179
N. A. G. Ahmed (Salford, UK)

Morphological and structural studies of β-$FeSi_2$ films grown by ion beam assisted deposition 188
A. Terrasi, S. Ravesi, C. Spinalla, M. G. Grimaldi and A. La Mantia (Catania, Italy)

Ion-beam mixing with chemical guidance. Part III: phase formations as a kinetic rather than thermodynamic phenomenon 192
A. Miotello and R. Kelly (Trento, Italy)

Ion beam induced chemical vapour deposition for the preparation of thin film oxides 198
D. Leinen, A. Fernández, J. P. Espinós, T. R. Belderrain and A. R. González-Elipe (Sevilla, Spain)

Optical properties of ion-assisted deposited SiO thin films 202
A. J. de Castro, F. López, J. Meléndez and M. Fernández (Madrid, Spain)

Voids in epitaxial silicon films grown under different thermal conditions: void detection by thermal helium desorption. 206
A. van Veen (Delft, Netherlands), A. H. Reader, D. J. Gravesteijn and A. A. van Gorkum (Eindhoven, Netherlands)

Ion Beam-Induced Structural Modifications of Materials

Effect of ion bombardment on Cr–Si–O layers: an X-ray photoelectron spectroscopic study 211
I. Bertóti, A. Tóth, M. Mohai (Budapest, Hungary), R. Kelly (Trento, Italy) and G. Marletta (Rende, Italy)

Degradation of thin films: comparison between low Earth orbit experiments and laboratory simulations of the space environment 218
J. A. Woollam, R. A. Synowicki, J. S. Hale, N. J. Ianno, B. L. Spady (Lincoln, NE, USA), A. W. Moore (Parma, OH, USA) and P. Hambourger (Cleveland, OH, USA)

Comparative investigation by laser profilometry, scanning electron microscopy and atomic force microscopy of wear on solar-beam-irradiated partially oxidized TiN coatings 222
B. C. Oberländer, M. Franck, P. Campbell, J. P. Celis, J. Roos, L. Hellemans and J. Snauwaert (Heverlee, Belgium)

Microhardness and spectroscopy studies of surface modification of titanium alloys by melted metaphosphates 230
M. Deffontaines-Fourez, B. Deffontaines (Dunkerque, France), D. Chicot and A. Iost (Lille, France)

Microwave Plasma-Enhanced Chemical Vapour Deposition Processes

In situ spectroscopic ellipsometry studies of interfaces of thin films deposited by PECVD 234
B. Drévillon (Palaiseau, France)

Chemical vapor deposition in high-density low-pressure plasmas: reactor scale-up and performance 240
J. Pelletier and T. Lagarde (Meylan, France)

Electron cyclotron resonance plasma deposition of SiN_x for optical applications 247
P. V. Bulkin, P. L. Swart and B. M. Lacquet (Auckland Park, South Africa)

Millitorr range PECVD of a-SiO_2 films using TEOS and oxygen 251
F. Templier (St Martin d'Hères, France), L. Vallier (Meylan, France), R. Madar (St Martin d'Hères, France) J. -C. Oberlin and R. A. B. Devine (Meylan, France)

Plasma-Enhanced Chemical Vapour Deposition of a–c Films

Raman spectroscopy on nitrogen-incorporated amorphous hydrogenated carbon films 255
G. Mariotto (Povo, Italy), F. L. Freire, Jr., and C. A. Achete (Rio de Janeiro, Brazil)

In situ monitoring by soft X-ray spectrometry of amorphous carbon plasma deposition 260
P. B. Legrand, J. P. Dauchot and M. Hecq (Mons, Belgium)

Amorphous hydrogenated carbon films elaborated by plasma-assisted chemical vapour deposition: characterization of composition by nuclear methods 264
L. Deshayes, M. Charbonnier, M. Romand, T. Petit, N. Chevarier and A. Chevarier (Villeurbanne, France)

Plasma processes in methane discharges during r.f. plasma-assisted chemical vapour deposition of a-C:H thin films ... 269
E. H. A. Dekempeneer, J. Smeets, J. Meneve, L. Eersels and R. Jacobs (Mol, Belgium)

Optimization of a-$Si_{1-x}C_x$:H films prepared by ultrahigh vacuum plasma enhanced chemical vapour deposition for electroluminescent devices 274
F. Demichelis, G. Crovini, C. F. Pirri, E. Tresso, G. Amato (Torino, Italy), U. Coscia, G. Ambrosone (Napoli, Italy) and P. Rava (Torino, Italy)

Plasma-Enhanced Chemical Vapour Deposition Processes

Plasma enhanced chemical vapour deposition of boron nitride onto InP 278
A. Bath, O. Baehr, M. Barrada, B. Lepley (Metz, France), P. J. van der Put and J. Schoonman (Delft, Netherlands)

Thin film deposition of conductive tin oxide from tetramethyltin in a low pressure glow discharge diode reactor 282
Y. Farber, F. Khonsari-Arefi and J. Amouroux (Paris, France)

Plasma-enhanced chemical vapour deposition of amorphous silicon nitride for thin film diode active matrix liquid crystal displays 287
G. Oversluizen, W. H. M. Lodders (Eindhoven, Netherlands) and I. D. French (Redhill, UK)

Correlation between process parameters, chemical structure and electronic properties of amorphous hydrogenated Ge_xC_{1-x} films prepared by plasma-enhanced chemical vapour deposition in a three-electrode reactor 291
J. Tyczkowski, P. Kazimierski and H. Szymanowski (Łódź, Poland)

Surface fluorination of polyethylene films by different CF_4 glow discharges: effects of frequency and electrode configuration 295
Y. Khairallah, F. Arefi and F. J. Amoroux (Paris, France)

Preparation of low resistivity tungsten thin films deposited by microwave-plasma-enhanced chemical vapor deposition from the tungsten hexafluoride–hydrogen system 301
A. Belkacem, Y. Arnal, J. Pelletier, E. André and J. C. Oberlin (Meylan, France)

Electron cyclotron resonance plasma ion beam effects on the formation of SiC on Si(100) characterized by *in-situ* photoemission 305
M. Diani, D. Aubel, J. F. Bischoff, L. Kubler and D. Bolmont (Mulhouse, France)

Surface Chemistry in Chemical Vapour Deposition Processes

The surface chemistry and kinetics of tungsten chemical vapor deposition and selectivity loss 310
J. R. Creighton (Albuquerque, NM, USA)

Amorphous semiconductors: deposition chemistry and bonding 318
P. Hess (Heidelberg, Germany)

Low temperature selective growth of epitaxial Si and $Si_{1-x}Ge_x$ layers from SiH_4 and GeH_4 in an ultrahigh vacuum, very low pressure chemical vapour deposition reactor: kinetics and possibilities 324
M. Caymax, J. Poortmans, A. Van Ammel, M. Libezny, J. Nijs and R. Mertens (Leuven, Belgium)

Chemical Vapour Deposition Processes

Applications of rapid thermal chemical vapor deposition technology to ULSI material processing and device fabrication 329
U. Snnikrishnan, G. W. Yoon and D. L. Kwong (Austin, TX, USA)

On the relation between low-temperature epitaxial growth conditions and the surface morphology of epitaxial Si and $Si_{1-x}Ge_x$ layers, grown in an ultrahigh vacuum, very low pressure chemical vapour deposition reactor 335
M. Caymax, J. Poortmans, A. Van Ammel, J. Vanhellemont, M. Libezny, J. Nijs and R. Mertens (Leuven, Belgium)

Growth methodologies and characterization of different polycrystalline diamond films on Ta substrates 340
M. L. Terranova, M. Rossi, V. Sessa and G. Vitali (Roma, Italy)

Low temperature deposition of glass membranes for gas sensors 344
P. Althainz, A. Dahlke, J. Goschnick and H. J. Ache (Karlsruhe, Germany)

Silicon oxide thin films grown by Xe_2^* excimer lamp chemical vapour deposition: the role of the substrate temperature and the window–substrate distance 348
P. González, E. García, J. Pou, D. Fernández, J. Serra, B. León and M. Pérez-Amor (Vigo, Spain)

Growth of iridium films by metal organic chemical vapour deposition 352
T. Gerfin, W. J. Hälg, F. Atamny and K.-H. Dahmen (Zürich, Switzerland)

Chemical vapour deposition of hafnium carbide and characterization of the deposited layers by secondary-neutral mass spectrometry 356
H. F. Ache, J. Goschnick, M. Sommer (Karlsruhe, Germany), G. Emig (Erlangen, Germany), G. Schoch and O. Wormer (Karlsruhe, Germany)

Chemical vapour deposition of silicon carbide on mesophase pitch-based carbon fibres 361
G. Emig, N. Popovska and G. Schoch (Karlsruhe, Germany)

Granular films of iron oxide prepared by aerosol deposition for the detection of organic vapours 366
P. Althainz, L. Schuy, J. Goschnick and H. J. Ache (Karlsruhe, Germany)

Photoassisted metal organic vapour-phase epitaxy of ZnTe on GaAs 370
H. Dumont, B. Qu'Hen, J.-E. Bourée, W. Kuhn and O. Gorochov (Meudon, France)

Selective deposition of tungsten by chemical vapour deposition from SiH_4 reduction of WF_6 374
Ph. Gouy-Pallier, Ph. Lami and R. Morales (Meylan, France)

The influence of deposits in a metal–organic chemical vapour deposition apparatus on the stability of precursors 378
F.-R. Lang and K.-H. Dahmen (Zürich, Switzerland)

Oxide growth at a Si surface 383
L. Verdi, A. Miotello and R. Kelly (Povo, Italy)

Author Index 389

Subject Index 391

The publisher encourages the submission of articles in electronic form thus saving time and avoiding rekeying errors. A leaflet describing our requirements is available from the publisher upon request.